

REMARKS/ARGUMENTS

Applicants respectfully request entry of the foregoing and the continued examination of the application, as amended, in light of the remarks that follow.

The claimed invention, as amended, relates to an activated carbon suitable for use in electric double layer capacitors, in which:

(a) the activated carbon has a BET specific surface area of $2000 \text{ m}^2/\text{g}$ to $2500 \text{ m}^2/\text{g}$, and an average pore diameter of 1.95 nm (19.5 \AA) to 2.20 nm (22 \AA);

(b) the pore volume of pores having a pore diameter, as calculated according to a Cranston-Inkley method, of 5.0 nm (50 \AA) to 30.0 nm (300 \AA) is $0.05 \text{ cm}^3/\text{g}$ to $0.15 \text{ cm}^3/\text{g}$;

(c) the amount of oxygen contained per g of the activated carbon is 1.8 mg to 8.1 mg; and

(d) the activated carbon exhibits a spontaneous potential versus a lithium electrode of 2.85 V to 3.03 V in a non-aqueous electrolytic solution.

The present inventors have found that the combined physical and electrical features of the presently claimed activated carbon provide for the production of an electric double layer capacitor, which demonstrates a large output density per unit volume. In addition, an electric double layer capacitor having the claimed activated carbon undergoes only a slight decrease in power density, even when subjected to repeated charge and discharge cycles at a large electric current or when voltage is continuously applied thereto for a long period of time. Such an activated carbon, having the claimed combination of physical and electrical features, is nowhere disclosed or suggested in the cited prior art of record.

Accordingly, the maintained rejection of claims 1-2, and 4-22 under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over U.S. Patent No. 5,430,606 to Adachi et al. is respectfully traversed.

Further to Applicants remarks in the Request for Reconsideration filed May 2, 2005, the reference to Adachi et al. does not describe or suggest whatsoever the claimed activated

carbon, such that (c) the amount of oxygen contained per g of the activated carbon is 1.8 mg to 8.1 mg; and (d) the activated carbon exhibits a spontaneous potential versus a lithium electrode of 2.85 V to 3.03 V in a non-aqueous electrolytic solution.

The reference to Adachi et al. generally describes an activated carbon for use in electric double layer capacitors (column 1, lines 43-47), in which “a high capacitance carbonaceous material [is] obtained by heat-treating an activated carbon precursor at a temperature below 700 °C in an alkali metal hydroxide bath” (column 1, lines 48-51). This precursor material may include “coconut shells” (column 1, lines 56-68). In addition, the reference recites that “carbonization temperature is generally 400-950 °C” (column 2, lines 4-5), in which a temperature “exceeding 950 °C will fail to give high capacitance carbonaceous materials (column 2, lines 9-11). However, beyond the general description of the process steps and the relation of temperature to capacitance, the disclosure in columns 1-3 does not refer whatsoever to any **oxygen content** and/or **spontaneous potential** properties, as explicitly recited in the claimed invention. These properties are also not described or shown in any of Examples 1-6 and Tables 1-6 of the reference, which are indicated as the best mode for carrying out the invention (column 3, line 40 – column 6, line 43). Therefore, the reference to Adachi et al. does not describe all of the limitations required by the claimed invention.

Moreover, the claimed **oxygen content** and **spontaneous potential** properties would not be obvious in view of the reference, as the reference suggests methods of obtaining the activated carbon material that are different from the method for obtaining the claimed activated carbon material. For instance, as explained in the Response filed May 2, 2005 at page 2, the reference explicitly describes heat-treating in sodium hydroxide at a temperature of 400 to 500 °C, which directly relates to “a critical increase in capacitance” (column 3, lines

6-10). In addition, as demonstrated by Table 7, at column 6, there is a significant decrease in properties, such as capacitance, when the temperature is above 650 °C.

In contrast, in the present invention, the properties are obtained by heat treating activated carbon at a much higher temperature. For instance, “the amount of **oxygen contained** in the activated carbon is a value which is obtained by heat-treating the activated carbon at around 1000 °C” (specification at page 15, lines 10-13). Moreover, the “[a]mount of **oxygen contained** in the activated carbon is a factor exerting some influence on the durability of the electric double layer capacitor” (specification at page 15, lines 4-6). In addition, regarding the **spontaneous potential**, the specification notes that the “[i]n the case where the **spontaneous potential** is too large, there results reduction in durability of an electrode double layer capacitor assembled using such activated carbon (specification at page 14, lines 7-10). As such properties, as well as the related method for obtaining them, is neither described nor suggested by the reference, the claimed invention is not obvious in view of Adachi et al.

In view of the foregoing amendments and remarks, Applicants respectfully submit that the application is in condition for allowance. Applicants respectfully request favorable consideration and prompt allowance of the application.

Respectfully submitted,

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